Callan Institute

2021 Capital Markets Assumptions

Webinar

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Presenters

Jay Kloepfer is an executive vice president and director of the Capital Markets Research group, which helps clients with strategic planning, conducting asset allocation and asset/liability studies, developing optimal investment manager structures, evaluating defined contribution plan investment lineups, and providing custom research on a variety of investment topics. He is a member of Callan's Institute Advisory Committee and is a shareholder of the firm.

Adam Lozinski, CFA, is an assistant vice president and consultant in Callan's Capital Markets Research group. He is responsible for assisting clients with their strategic investment planning, conducting asset allocation studies, developing optimal investment manager structures, and providing custom research on a variety of investment topics. Adam is a holder of the right to use the Chartered Financial Analyst® designation, and is a member of CFA Institute and CFA Society Colorado.

Kevin Machiz, CFA, FRM, is a vice president and consultant in Callan's Capital Markets Research group. He is responsible for assisting clients with their strategic investment planning, conducting asset allocation studies, developing optimal investment manager structures, and providing custom research on a variety of investment topics. Kevin is also the head of Callan’s multi-asset class research effort and a shareholder of the firm. Kevin is a holder of the right to use the Chartered Financial Analyst® designation, and is a member of CFA Institute and CFA Society Portland. He is a Certified Financial Risk Manager.

Agenda

- **Process overview**
- **Why does Callan create capital markets projections?**
- **Current market conditions**
- **2021 expectations**
  - Economic outlook
  - Asset class outlook
    - *Equity*
    - *Fixed income*
    - *Alternative investments*
  - Forecast parameters
    - *Returns*
    - *Risk*
    - *Correlation*
- **Detailed 2021 projections and resulting portfolio returns**

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Process Overview

Jay Kloepfer

Why Make Capital Markets Projections?

Guiding objectives and process

Cornerstone of a prudent process is a long-term strategic investment plan

- Capital markets projections are key elements — set reasonable return and risk expectations for the appropriate time horizon
- Projections represent our best thinking regarding the long-term (10-year) outlook, recognizing our median projections represent the midpoint of a range, rather than a specific number
- Develop results that are readily defensible both for individual asset classes and for total portfolios
- Be conscious of the level of change suggested in strategic allocations for long-term investors: DB plan sponsors, foundations, endowments, trusts, DC participants, families, and individuals
- Reflect common sense and recent market developments, within reason

Callan's forecasts are informed by current market conditions, but are not built directly from them

- Balance recent, immediate performance and valuation against long-term equilibrium expectations

How Are Capital Markets Projections Constructed?

Guiding objectives and process

Underlying beliefs guide the development of the projections:

- An initial bias toward long-run averages
- A conservative bias
- An awareness of risk premiums
- A presumption that markets are ultimately clear and rational

Reflect our beliefs that long-term equilibrium relationships between the capital markets and lasting trends in global economic growth are key drivers to setting capital markets expectations

Long-term compensated risk premiums represent “beta”—exposure to each broad market, whether traditional or “exotic,” with limited dependence on successful realization of alpha

The projection process is built around several key building blocks:

- Advanced modeling at the individual asset class level (e.g., a detailed bond model, an equity model)
- A path for interest rates and inflation
- A cohesive economic outlook
- A framework that encompasses Callan beliefs about the long-term operation and efficiencies of the capital markets

How Are Capital Markets Projections Constructed?

Projections are 10-year forward-looking, representing a medium to long-term planning horizon:

- Differs from the actuarial assumptions, which tend to reflect longer-term horizons of 30–40 years

Projections consist of return and two measures that contribute to portfolio volatility: standard deviation and correlation

Cover most broad asset classes and inflation

- **Broad U.S. equity**
  - Large cap
  - Smid cap
- **Global ex-U.S. equity**
  - Developed market
  - Emerging market
- **U.S. fixed income**
  - Short duration
  - Core U.S. fixed
  - TIPS
  - High yield
  - Long duration (government, credit, and government / credit)
- **Global ex-U.S. fixed income**
- **Real estate**
- **Alternative investments: private equity, hedge funds, private credit**
- **Cash**
- **Inflation**

How Does the Process Work?

For internal consumption: how the sausage is made

Start in summer of 2020

- CMR group, input from asset class specialists, consultants, management
  - Articulate goals for the update
  - Purpose of the projections, impact of changes on investor behavior, comparison to forecasts around the industry
  - What has changed in the capital markets in one year to warrant revision to longer-term expectations?
- Agreement on inflation, path to future interest rates, targets for segments of the fixed income market
  - Bond model to test scenarios and develop range of expectations
- Equity – real returns, risk premia, relation to fixed income expectations, change in valuation (if compelling)
  - Model to incorporate income, appreciation, any valuation change
- Set path for 2021
  - Lower fixed income expectations after arrival of the pandemic, Fed return to zero interest rate policy, stimulus, recession
  - Revisit equity expectations – equity risk premium over lower fixed income expectations
  - Refine and confirm suggested advantages of diversification benefit
- Test and tune expectations for reasonable asset mixes
  - Impose long-term beliefs and practical implementation
- Release projections and present to Callan clients January 14, 2021

2021–2030 Callan Capital Markets Assumptions

Asset Class	Index	Projected Return: 1-Year Arithmetic	Projected Return: 10-Year Geometric*	Projected Return: Real	Projected Risk: Standard Deviation	Projected Yield
Equities						
Broad U.S. Equity	Russell 3000	8.00%	6.60%	4.60%	17.95%	1.95%
Large Cap U.S. Equity	S&P 500	7.85%	6.50%	4.50%	17.70%	2.00%
Smid Cap U.S. Equity	Russell 2500	8.75%	6.70%	4.70%	21.30%	1.75%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.70%	6.80%	4.80%	20.70%	2.80%
Developed ex-U.S. Equity	MSCI World ex USA	8.25%	6.50%	4.50%	19.90%	3.00%
Emerging Market Equity	MSCI Emerging Markets	9.80%	6.90%	4.90%	25.15%	2.35%
Fixed Income						
Short Duration Gov't/Credit	Bloomberg Barclays 1-3 Yr Gov / Credit	1.50%	1.50%	-0.50%	2.00%	1.55%
Core U.S. Fixed	Bloomberg Barclays Aggregate	1.80%	1.75%	-0.25%	3.75%	2.50%
Long Government	Bloomberg Barclays Long Government	1.35%	0.60%	-1.40%	12.50%	3.00%
Long Credit	Bloomberg Barclays Long Credit	2.95%	2.45%	0.45%	10.50%	4.65%
Long Government/Credit	Bloomberg Barclays Long Gov / Credit	2.30%	1.80%	-0.20%	10.35%	4.00%
TIPS	Bloomberg Barclays TIPS	1.80%	1.70%	-0.30%	5.05%	2.35%
High Yield	Bloomberg Barclays High Yield	4.85%	4.35%	2.35%	10.75%	6.70%
Global ex-U.S. Fixed	Bloomberg Barclays Global Agg xUSD	1.15%	0.75%	-1.25%	9.20%	1.80%
Emerging Market Sovereign Debt	EMBI Global Diversified	3.90%	3.50%	1.50%	9.50%	5.95%
Other						
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.75%	14.10%	4.40%
Private Infrastructure	MSCI Global Infra / FTSE Dev Core 50/50	7.00%	6.00%	4.00%	15.45%	4.60%
Private Equity	Cambridge Private Equity	11.50%	8.00%	6.00%	27.80%	0.00%
Private Credit	n/a	7.15%	6.25%	4.25%	14.60%	6.25%
Hedge Funds	Callan Hedge FOF Database	4.25%	4.00%	2.00%	8.00%	0.00%
Commodities	Bloomberg Commodity	3.80%	2.25%	0.25%	18.00%	2.00%
Cash Equivalents	90-Day T-Bill	1.00%	1.00%	-1.00%	0.90%	1.00%
Inflation	CPI-U		2.00%		1.50%	

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

Current Market Conditions

Setting Capital Markets Expectations in an Uncertain Environment

One challenge to creating long-term forecasts is a shifting market environment.

- Where do you start?
  - Time horizon?
  - Does valuation matter?
  - What interest rate?
  - A downturn in the economy and cycles in the capital markets are fully expected over a 10-year cycle
  - Discipline in the face of uncertainty is difficult
- Arbitrary impact of plan year end dates on sponsor's results. Your funded status would look a lot different if your plan year ends on 6/30 or 9/30 rather than 12/31/20.
- Interest rate volatility wreaks havoc with LDI glidepaths

Market volatility since February 2020 is important, but we question how much it should impact a 10-year outlook used to guide strategic investment policy.

- Equity market bottomed in March, then surged through most of the second, third, and fourth quarters
- Fed cut rates to zero immediately and has no short-term plans to even think about raising rates
- Over-reliance on data at a specific starting date assigns outsized impact of current valuations on a 10-year forecast, but…
- Long-term forecast should not be moving month to month; suggests a level of precision and market timing that is not practical
- One can argue that we have pulled future returns forward from the next couple of years for both stocks and bonds in 2020

Rhetoric aside, we believe this time the shorter-term changes in the capital markets, particularly the bond market, have indeed been deep enough to change our outlook.

Market Environment: 3Q20

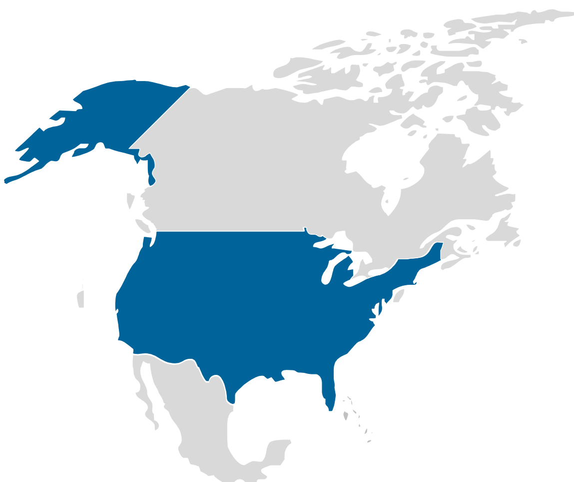
High degree of uncertainty

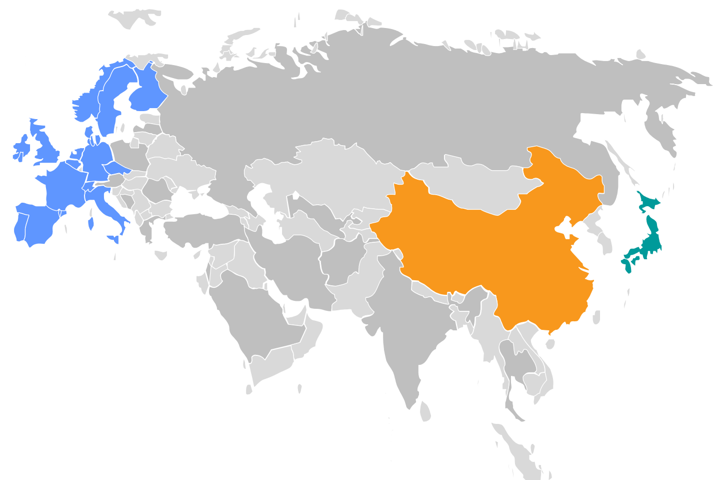
U.S.

- 2Q GDP fell -31.4%, largest decline on record; 3Q gain of 33%, solid growth of 3% estimated for 4Q
- Retail sales, durable goods, and personal spending rebounded in 2Q and 3Q, but growth slowed in August and September as stimulus waned
- Unemployment dropped to 6.7% in November from 14.7% April peak
  - Jobless claims decelerated to less than 1 million per week, but are still elevated relative to prior recession peaks.
- Housing benefiting from relatively low mortgage rates
- Fed left rates close to 0% and expects to be on hold until at least 2023

Overseas

- Euro zone 1Q GDP contracted 3.7% (-14% annualized), followed by 11.7% drop (-39.2% annualized) in 2Q; largest Q drop on record; 12.5% jump (60% annualized!) in 3Q
- U.K. GDP sank 18.8% in 2Q (-57% annualized)—most ever, rebounded 16% (81% annualized) in 3Q
- Japan’s economy shrank 8.3% (-29% annualized) in 2Q; third straight quarterly drop, dating back to 2019; 5.3% growth (22.9% annualized) in 3Q
- China’s GDP fell 10% (-34% annualized) in 1Q, but rebounded 11.7% (+56%) in 2Q and is up 2.7% (11.3% annualized) in 3Q; only country expected to grow in 2020





Stunning Recovery in Global Equity Markets in 3Q20

V-shaped equity rebound, ahead of the global economy

Global equity continued the rally in 4Q after March market bottom.

- S&P -33.5% from peak (02/19/20) to low on 3/23/20
- Rebound since March lifted the S&P 500 by 70% through December! However, the strong recovery was concentrated in a few stocks – mega cap, IT.
- Fed cut rates to zero, commenced QE, instituted multiple facilities to backstop money markets, credit markets, and economy
  - *Fed expects to get paid back*
  - *Further fiscal stimulus added at year-end*
- Economic recovery will be uncertain in 2021. Release of vaccines a huge positive development, but distribution challenges may keep widespread inoculation from being achieved until mid-year. As COVID-19 infections surge anew, re-openings may be reversed in many states and localities.

Returns for Periods ended 12/31/20

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	14.68	20.89	15.43	13.79	9.67
S&P 500	12.15	18.40	15.22	13.88	9.56
Russell 2000	31.37	19.96	13.26	11.20	9.05
Global ex-U.S. Equity					
MSCI World ex USA	15.85	7.59	7.64	5.19	5.17
MSCI Emerging Markets	19.70	18.31	12.81	3.63	--
MSCI ACWI ex USA Small Cap	18.56	14.24	9.37	5.95	6.49
Fixed Income					
Bloomberg Barclays Aggregate	0.67	7.51	4.44	3.84	5.16
90-day T-Bill	0.03	0.67	1.20	0.64	2.27
Bloomberg Barclays Long Gov/Credit	1.68	16.12	9.35	8.16	7.42
Bloomberg Barclays Global Agg ex-US	5.09	10.11	4.89	1.99	3.97
Real Estate					
NCREIF Property	0.74	1.19	5.82	8.96	9.08
FTSE Nareit Equity	11.57	-8.00	4.77	8.31	9.64
Alternatives					
CS Hedge Fund*	3.44	2.41	2.76	3.64	7.25
Cambridge Private Equity*	10.82	18.54	13.90	13.85	15.41
Bloomberg Commodity	10.19	-3.12	1.03	-6.50	1.00
Gold Spot Price	-0.02	24.42	12.32	2.92	6.55
Inflation - CPI-U	0.07	1.36	1.59	1.66	2.10

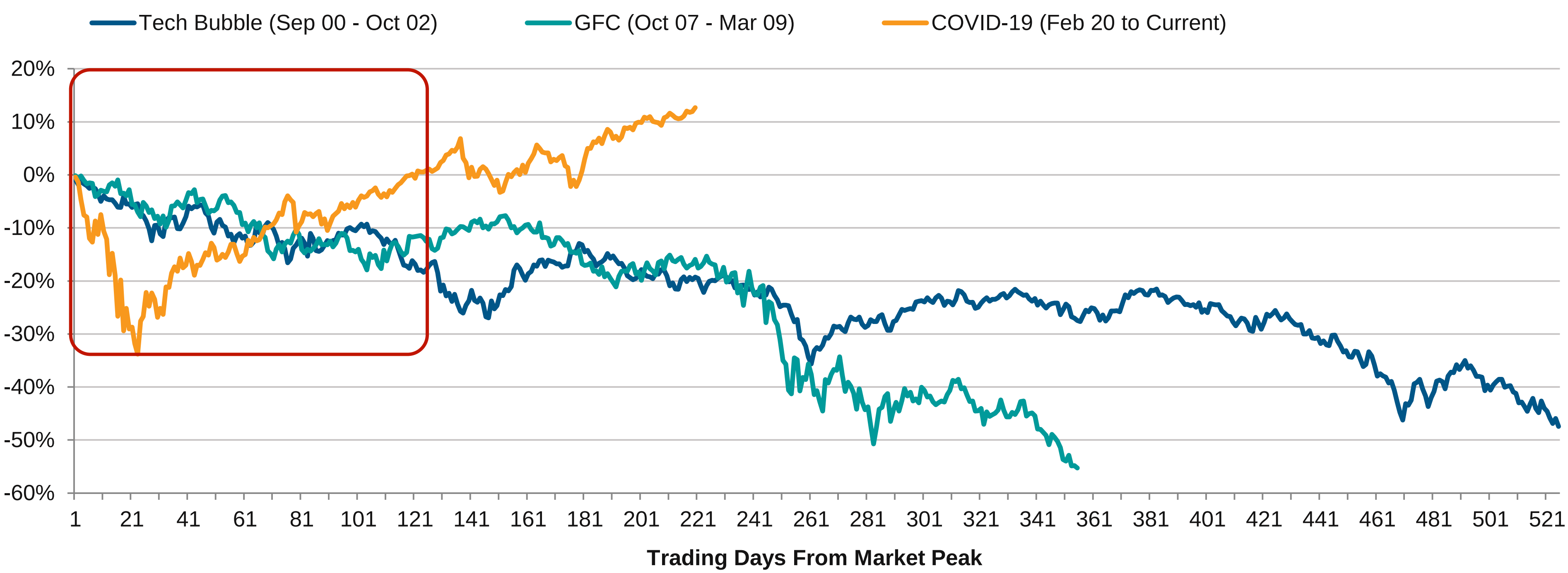
*Cambridge PE data through 09/30/20; CS Hedge Fund Index data through 9/30/20;
Sources: Bloomberg, Bloomberg Barclays, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

Unprecedented Shock to Global Capital Markets—Is It Really Over?

V-shaped recovery in equity—back in black by mid-August, up 18.4% for the year!

S&P 500 Cumulative Returns

Market Peak-to-Trough for Recent Corrections vs. Current Path of COVID-19 Correction Through 12/31/20



The sharpest and fastest equity market decline ever: 16 trading days to reach bear market; -33% after just 23 days

- Incredible rebound in U.S. equity market in 2Q and 3Q
  - The S&P 500 recovered all of its COVID-19 related losses by August 10, only 97 days from the bottom
  - 70% return from the market bottom through December 31, 2020
  - Positive return year-to-date (+18.4% through December 31, 2020)

Sources: Callan, S&P Dow Jones Indices

Role of economic variables

GDP and Inflation

GDP forecasts provide a very rough estimate of future earnings growth.

Inflation forecasts provide an approximate path for short-term yields.

Inflation is added to the real return forecasts for equity and fixed income.

GDP Forecasts

- 2% to 2.5% for the U.S.
- 1.5% to 2.0% for developed ex-U.S. markets
- 4% to 5% for emerging markets

All forecasts are below long-term averages.

Path to longer-term growth will include cycles with recessions.

Inflation Forecasts

- 1.75% to 2.25% for the U.S.
- 1.5% to 2.0% for developed ex-U.S. markets
- 2.25% to 2.75% for emerging markets

Fixed Income

Kevin Machiz, CFA, FRM

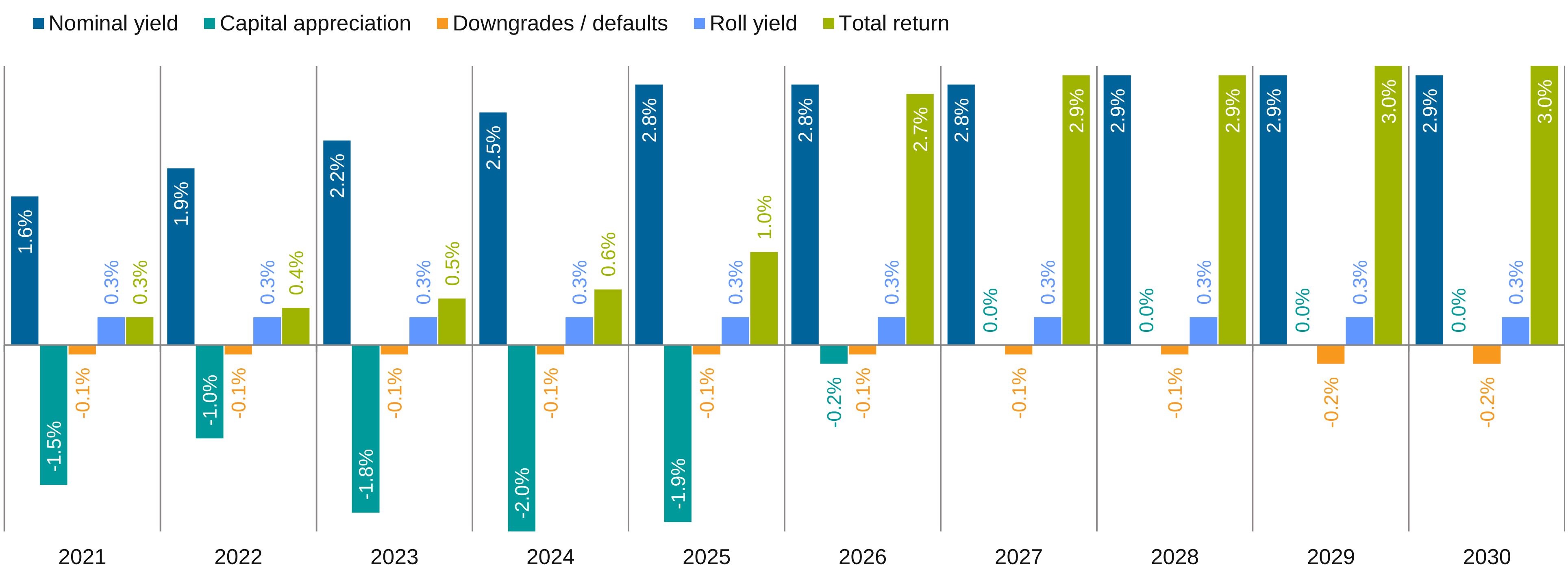
2021 Bond Assumptions

	Income Return	+	Capital Gain / Loss	+	Credit Default	+	Roll Return	=	2021 Expected Return
Cash	**1.00%**		**0.00%**		**0.00%**		**0.00%**		**1.00%**
Short Duration 1-3 Year G/C	**1.55%**		**-0.30%**		**0.00%**		**0.25%**		**1.50%**
1-3 Year Government	1.45%		-0.30%		0.00%		0.25%		1.40%
1-3 Year Credit	2.10%		-0.30%		-0.20%		0.25%		1.85%
Intermediate G/C	**1.85%**		**-0.50%**		**-0.10%**		**0.25%**		**1.50%**
Intermediate Government	1.55%		-0.50%		0.00%		0.25%		1.30%
Intermediate Credit	2.50%		-0.60%		-0.30%		0.25%		1.85%
Aggregate	**2.50%**		**-0.90%**		**-0.10%**		**0.25%**		**1.75%**
Government	2.15%		-1.20%		0.00%		0.25%		1.20%
Securitized	2.05%		-0.30%		0.00%		0.25%		2.00%
Credit	3.35%		-1.20%		-0.40%		0.25%		2.00%
Long Duration G/C	**4.00%**		**-2.50%**		**-0.30%**		**0.60%**		**1.80%**
Long Government	3.00%		-3.00%		0.00%		0.60%		0.60%
Long Credit	4.65%		-2.30%		-0.50%		0.60%		2.45%
TIPS	**2.35%**		**-0.90%**		**0.00%**		**0.25%**		**1.70%**
Global ex-U.S. Fixed (unhedged)	**1.80%**		**-1.20%**		**-0.10%**		**0.25%**		**0.75%**
High Yield	**6.70%**		**-0.40%**		**-2.20%**		**0.25%**		**4.35%**
Emerging Market Debt	**5.95%**		**-1.30%**		**-1.40%**		**0.25%**		**3.50%**
Bank Loans	**6.00%**		**-0.10%**		**-1.60%**		**0.00%**		**4.30%**

- Yields declined significantly in 2020
- Rising yields in Callan's baseline are especially supportive of shorter duration fixed income

2021–2030 Aggregate Return = 1.75%

Total Return Attribution



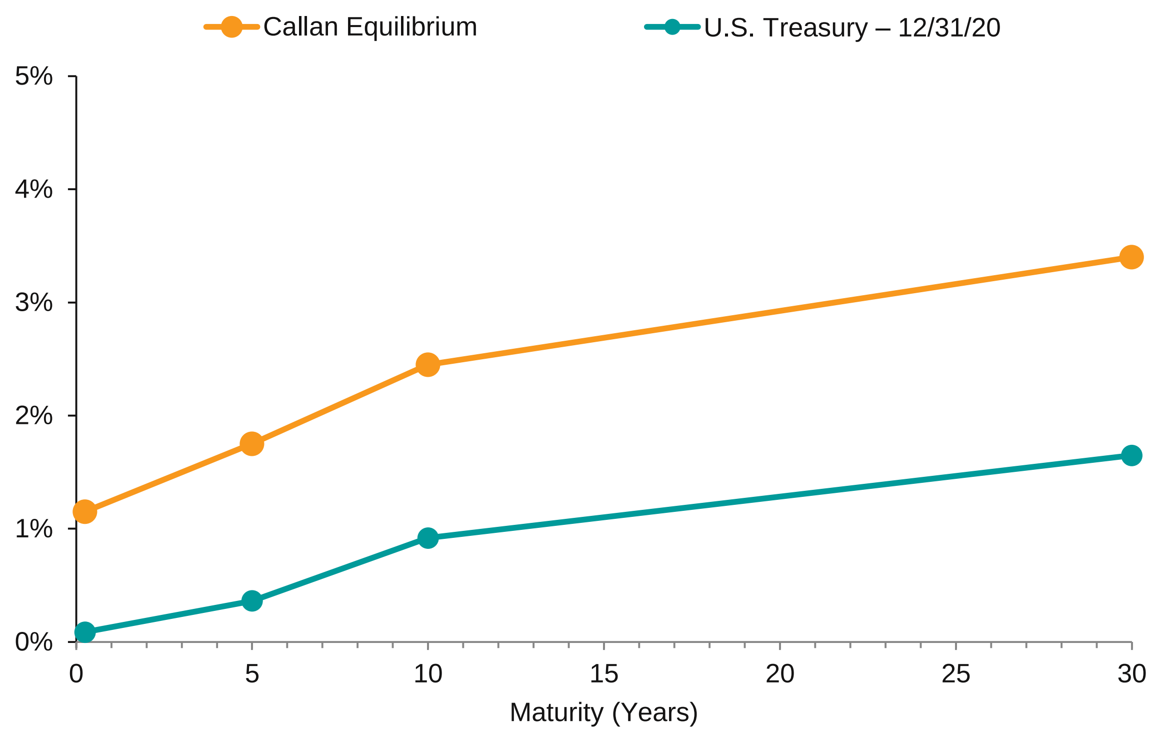
- Above chart shows return components of the aggregate over the next 10 years
  – Aggregate yield rises about 120 bps over five years
- We examined a variety of scenarios to test their impact on assumed return for the aggregate
  – Fixed income duration falls slightly in a rising rate environment
  – Narrowing of credit and securitized spreads

Callan Equilibrium Yield Curve

The Callan equilibrium yield curve is higher and steeper than the current yield curve

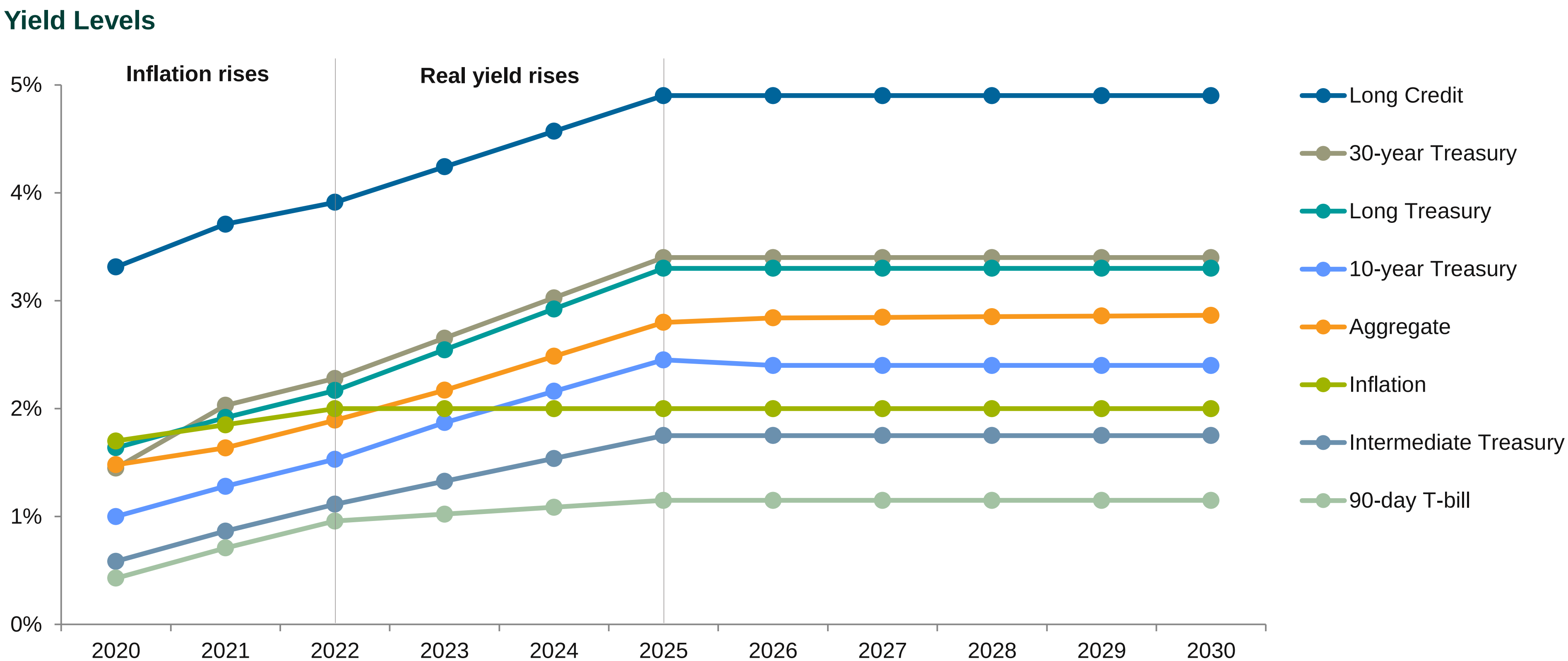
	Callan Equilibrium
90-day T-bill	1.15%
Intermediate Treasury	1.75%
10-year Treasury	2.45%
30-year Treasury	3.40%

Yield Curves



Sources: FRED

Base Case Path for Fixed Income Yields



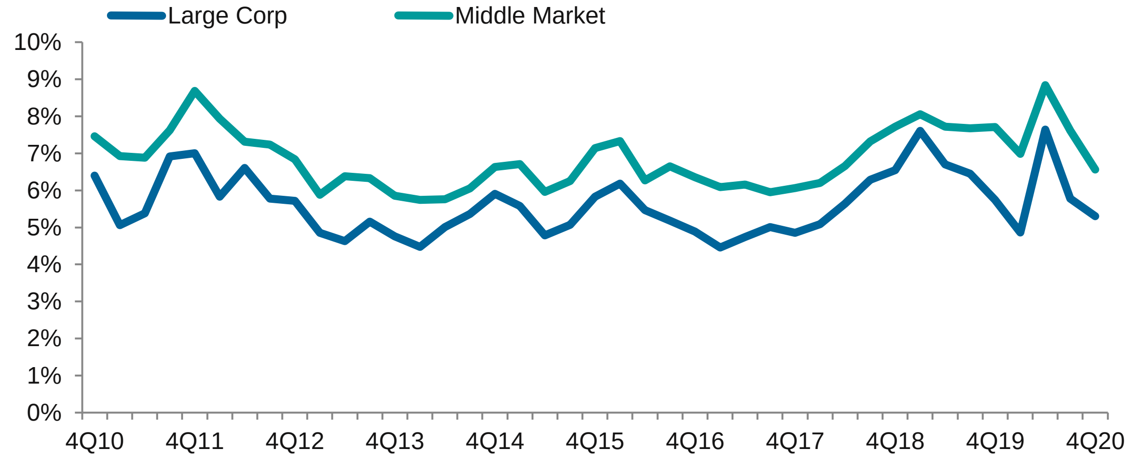
- Rate rise in first two years is due to inflation only
  – Inflation rises from 1.7% to 2.0% over 2 years – 15 bps per year
- Cash and intermediate Treasury have negative real yields over the next 10 years

Private Credit

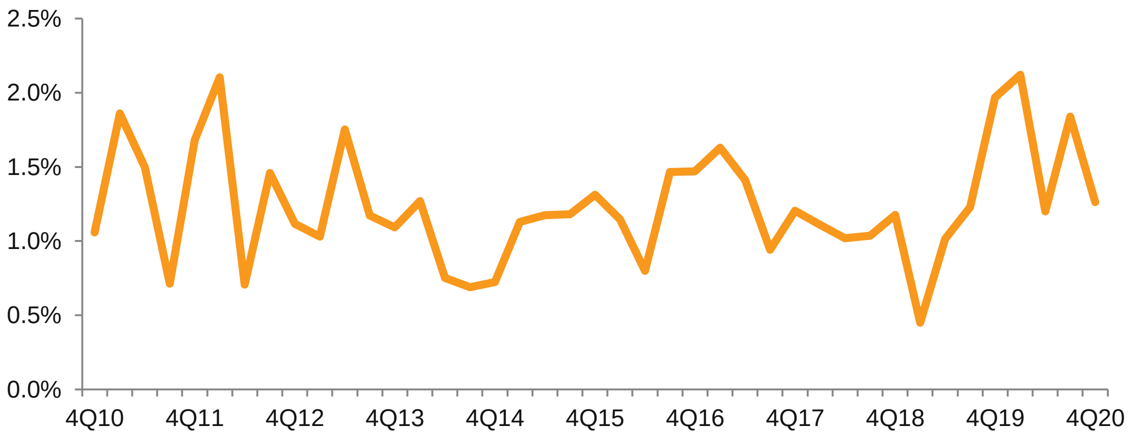
- Return calculations assume 2.5% cost of leverage and 0.75% unlevered loss ratio
- Corresponds to 6.25% geometric

Unlevered Yield	7.5%
Leverage	0.85x
Levered Yield	11.6%
Management Fee and Operating Expense	2%
Incentive Rate	15%
Hurdle	4%
Incentive Fee	1%
Total Fee	3%
Loss Ratio	1.4%
Net Arithmetic	7%

Loan Yields



Middle Market Premium



Source: Refinitiv LPC. All-in yield (LIBOR + Spread + OID) assuming 3-year takeout
Note: 2Q20 was deemed less reliable due to lack of data points to calculate a MM institutional all-in yield statistic

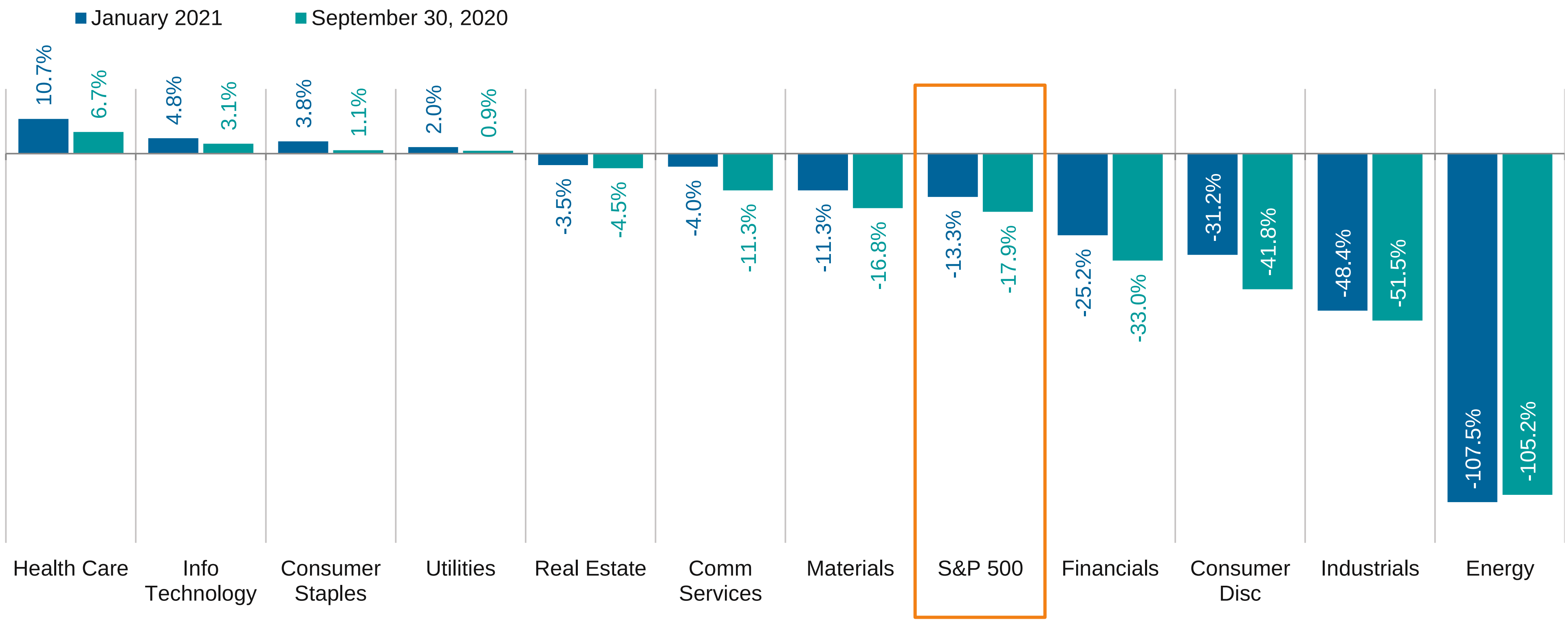
Equity

Adam Lozinski, CFA

U.S. Equity Projections

Large cap earnings

S&P 500 Earnings Growth: Calendar Year 2020



Earnings likely took a significant hit across most sectors in calendar year 2020

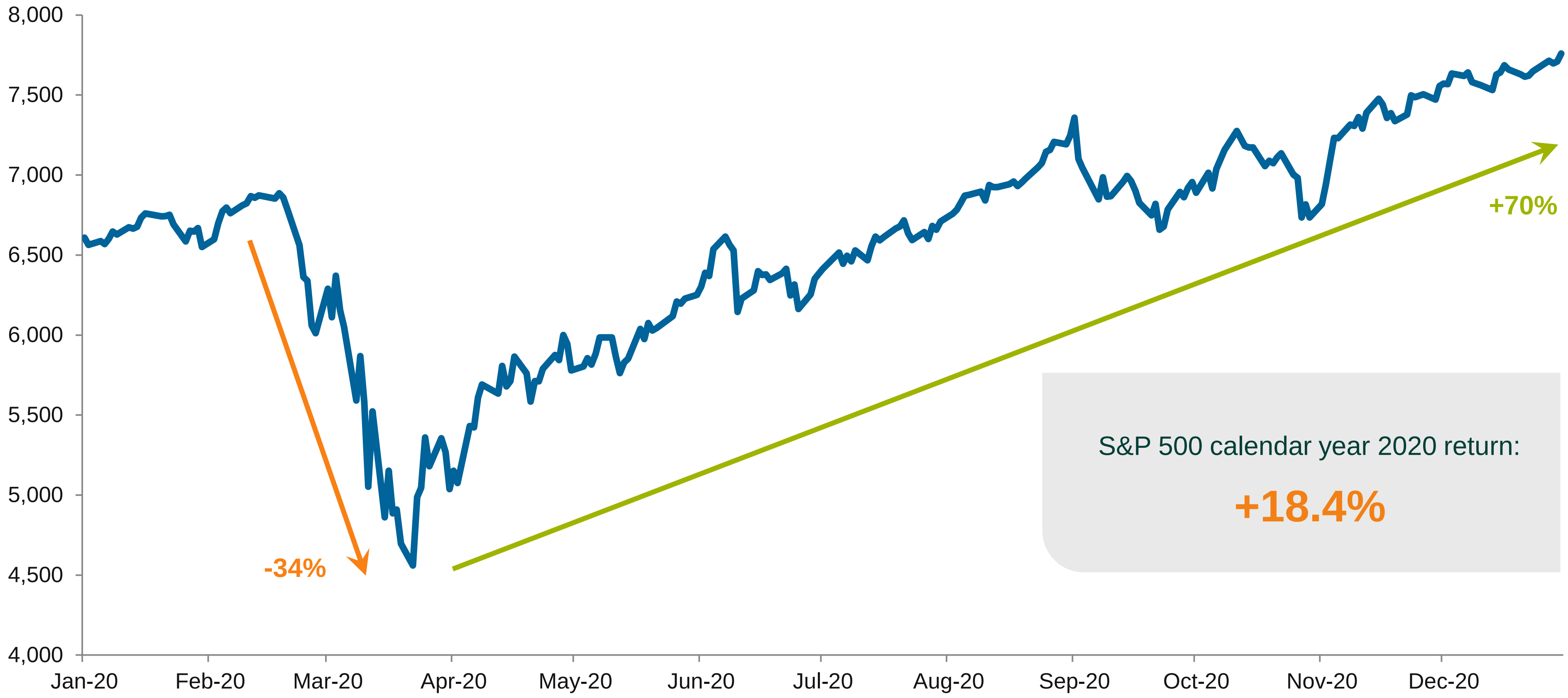
- Earnings for the S&P as a whole are expected be down over 13%
- Health Care, Information Technology, Consumer Staples, and Utilities were the only sectors expected to have positive 2020 earnings
- 5 sectors expected to have double-digit declines

Source: FactSet Earnings Insight as of January 8, 2021.

U.S. Equity Projections

Large cap valuations

S&P 500 Total Return Price Index
Calendar Year 2020



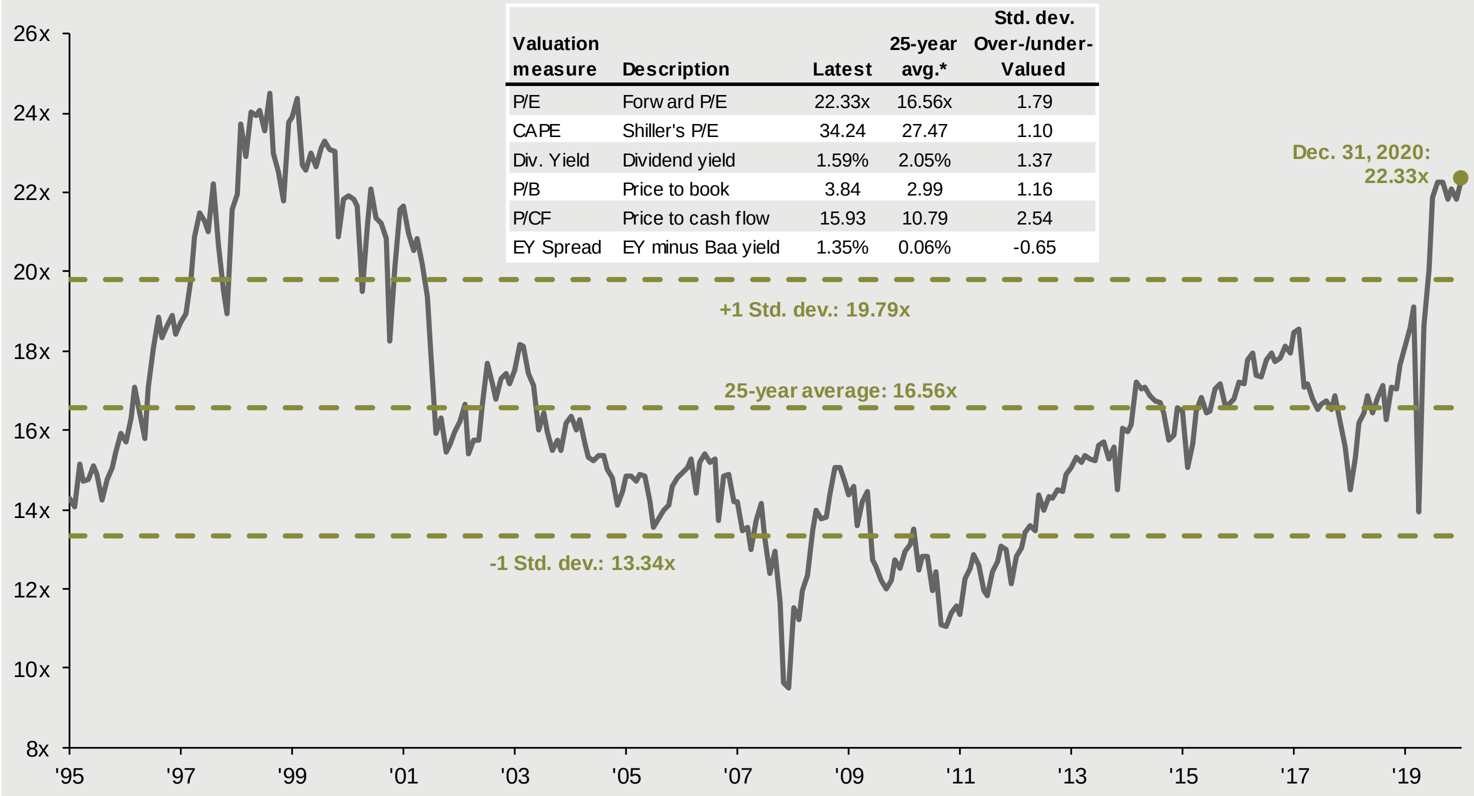
- Substantial price appreciation has occurred in spite of poor earnings
- Low Treasury yields are helping to support valuations

Source: S&P Dow Jones Indices.

U.S. Equity Projections

Large cap valuations

S&P 500 Index: Forward P/E ratio



Valuation measure	Description	Latest	25-year avg.*	Std. dev. Over-/under-Valued
P/E	Forward P/E	22.33x	16.56x	1.79
CAPE	Shiller's P/E	34.24	27.47	1.10
Div. Yield	Dividend yield	1.59%	2.05%	1.37
P/B	Price to book	3.84	2.99	1.16
P/CF	Price to cash flow	15.93	10.79	2.54
EY Spread	EY minus Baa yield	1.35%	0.06%	-0.65

Price-to-earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months as provided by IBES since December 1995, and FactSet for December 31, 2020. Current next 12-months consensus earnings estimates are $167. Average P/E and standard deviations are calculated using 25 years of IBES history. Shiller's P/E uses trailing 10-years of inflation-adjusted earnings as reported by companies. Dividend yield is calculated as the next 12-months consensus dividend divided by most recent price. Price-to-book ratio is the price divided by book value per share. Price-to-cash flow is price divided by NTM cash flow. EY minus Baa yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) minus the Moody's Baa seasoned corporate bond yield. Std. dev. over-/under-valued is calculated using the average and standard deviation over 25 years for each measure.

Guide to the Markets – U.S. Data are as of December 31, 2020.

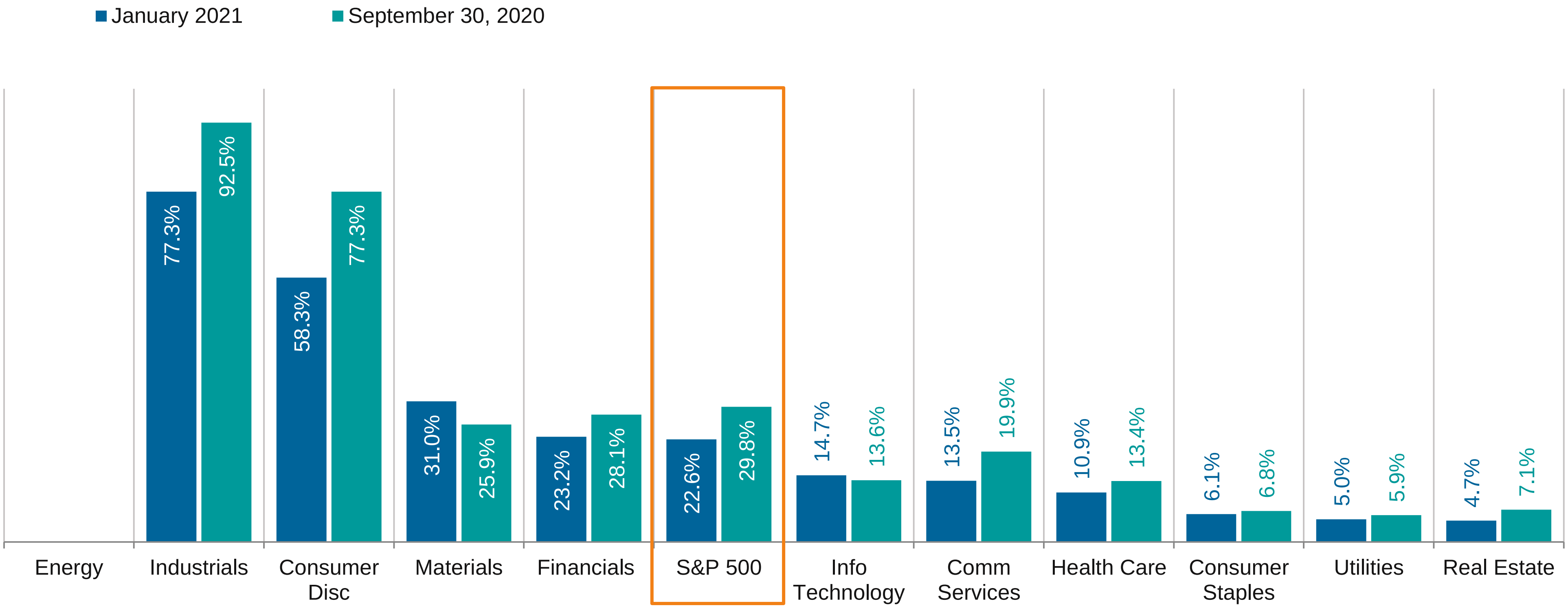
- Valuations are 1.8 standard deviations above the 25-year average based on forecast earnings
- Longer term historical valuations are also elevated
  - Shiller's cyclically adjusted price earnings (CAPE) ratio is 1.1 standard deviation above average
- Stock prices reflect anticipated rather than historical earnings

Sources: FactSet, FRB, Robert Shiller, S&P Dow Jones Indices, Thomson Reuters, J.P. Morgan Asset Management.

U.S. Equity Projections

Large cap earnings

S&P 500 Earnings Growth: Calendar Year 2021

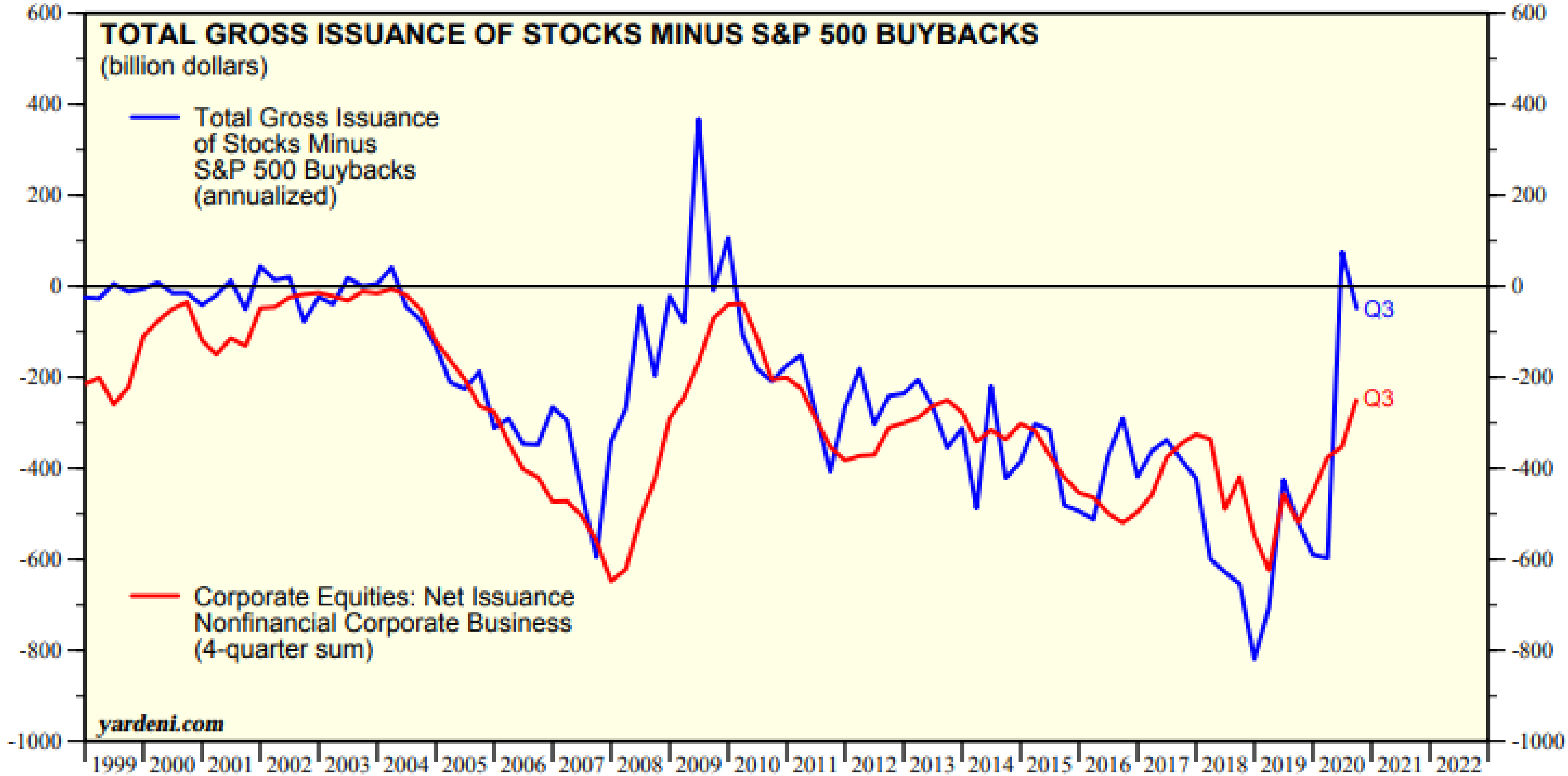


- Earnings expected to continue their bounce back
- S&P 500 earnings growth in excess of 20% is projected in 2021
  – 7 sectors expected to realized double-digit earnings growth
- However confidence is eroding
  – Earnings estimates in many sectors are down from the end of 3Q, some significantly

Source: FactSet Earnings Insight as of January 8, 2021.

U.S. Equity Projections

Stock net issuance



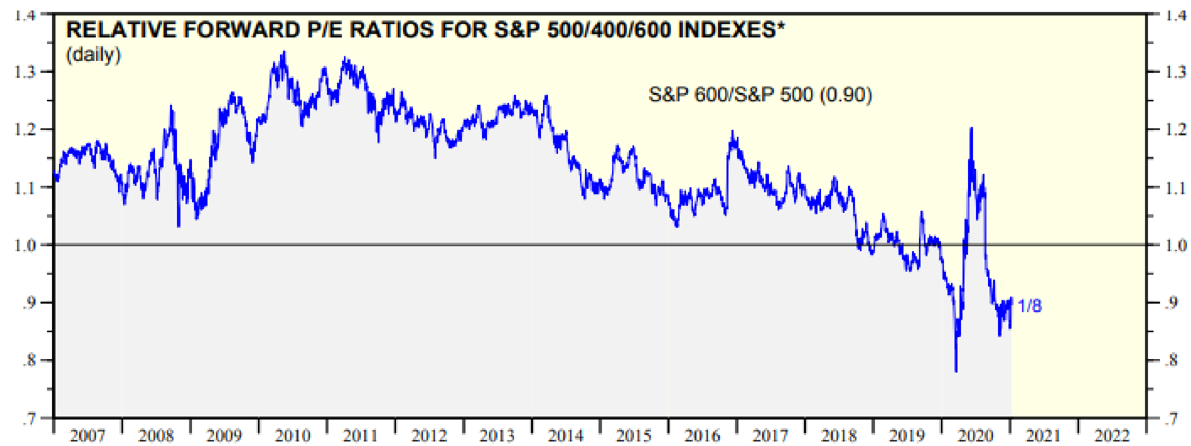
- Net issuance has generally been negative for almost 20 years
- Negative net new issuance has boosted EPS
- Recent increases in net new issuance reflect similar patterns near the GFC
  - Could provide a head wind for future returns

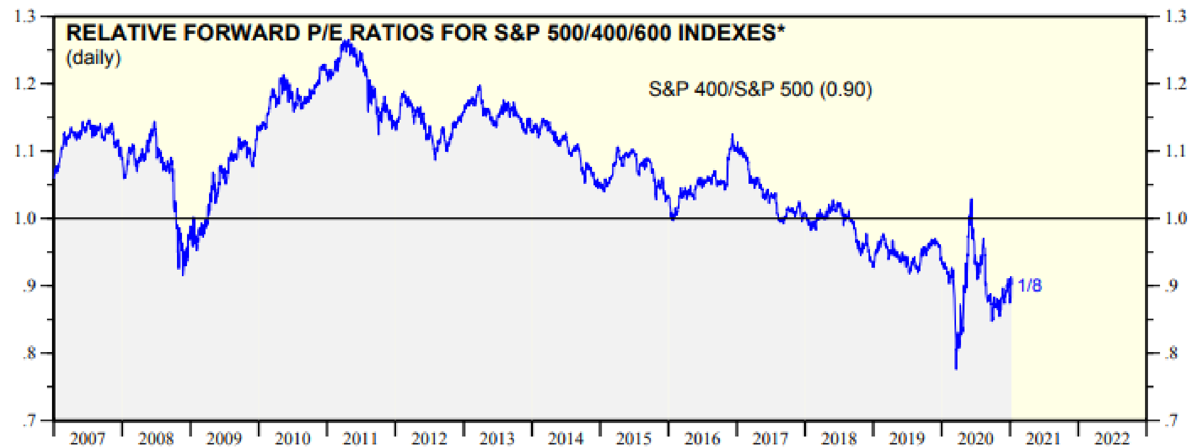
Source: Yardeni.com (Federal Reserve Board and Standard & Poor's Corporation)

U.S. Equity Projections

Mid and small cap relative valuations

- Large capitalization stocks have relatively high valuations
- Historically, smaller cap stocks have had higher valuations than large caps
  - Investors buying future rather than historical earnings
- The small cap S&P 600 P/E is only 90% of the S&P 500 P/E
- The mid cap S&P 400 P/E is only 90% of the S&P 500 P/E
- Lower valuations improve the potential for higher returns relative to large cap going forward





Source: Yardeni.com

Global ex-U.S. Equity Projections

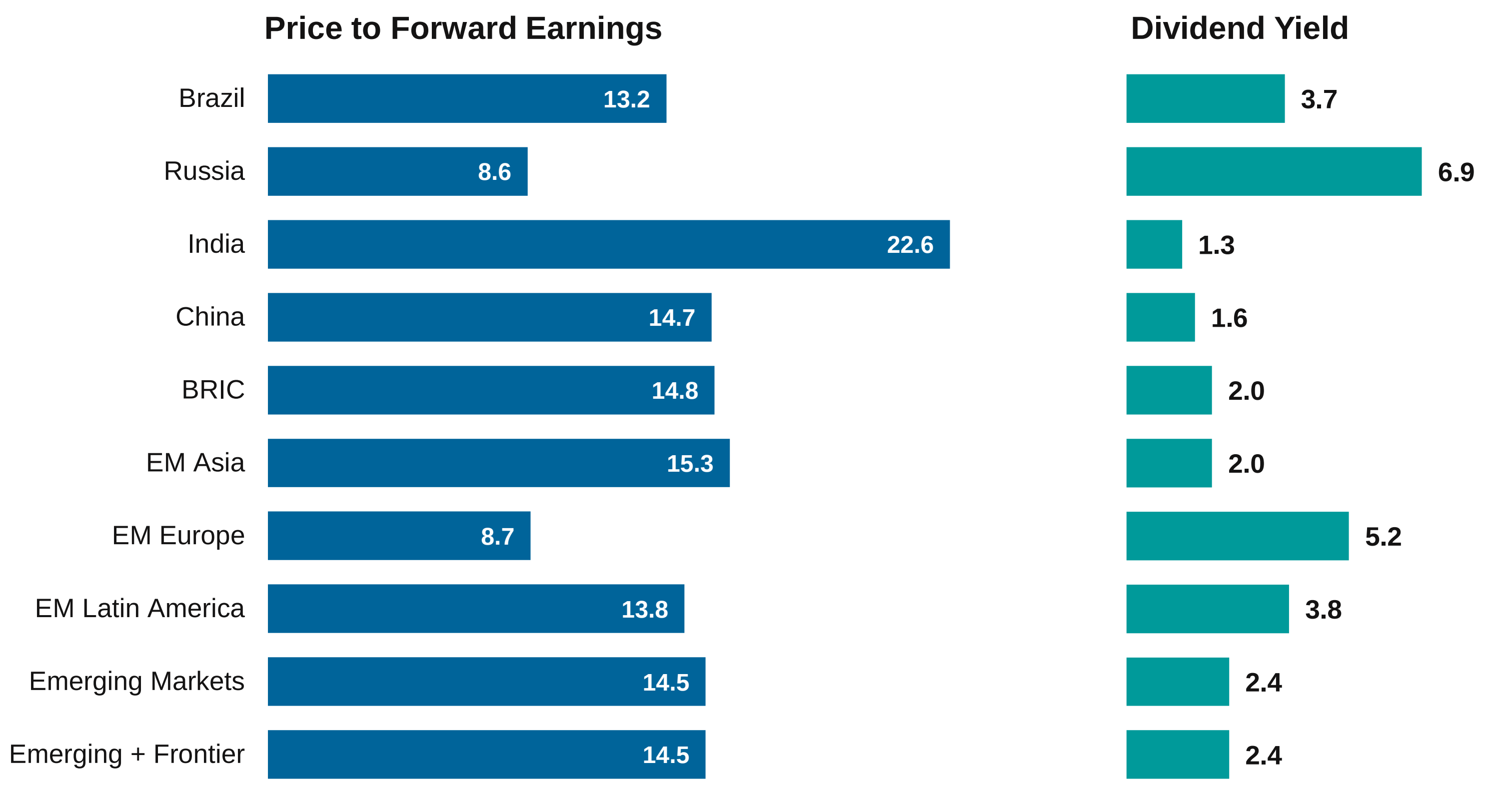
Developed market valuations and dividend yield

- Valuations are generally high in developed markets
  - U.S. has the highest valuations
  - U.K. has the lowest valuations most likely due to Brexit
- Low dividend yields have a direct impact on returns
  - Depressed in the current environment

Source: MSCI

Global ex-U.S. Equity Projections

Emerging market valuations and dividend yield



- Emerging markets also have elevated valuations
  - Among the BRICs, India has the highest valuation metrics while Russia is lagging
  - Asia has the highest regional valuations, Europe the lowest
- Significant dilution as growing companies issue more shares

Source: MSCI

U.S. Equity Projections

Large and smid cap

- S&P 500
  - Arithmetic return = 7.85%
  - Compound return = 6.50%
  - Standard deviation = 17.70%
  - Compound return falls by 50 bps relative to 2020
  - Valuation adjustment and lower inflation are drags on the nominal return
- Russell 2500
  - Arithmetic return = 8.75%
  - Compound return = 6.70%
  - Standard deviation = 21.30%
  - Compound return reduced by 55 bps from 2020 projection
  - Low earnings and dividends as well as inflation weigh on returns

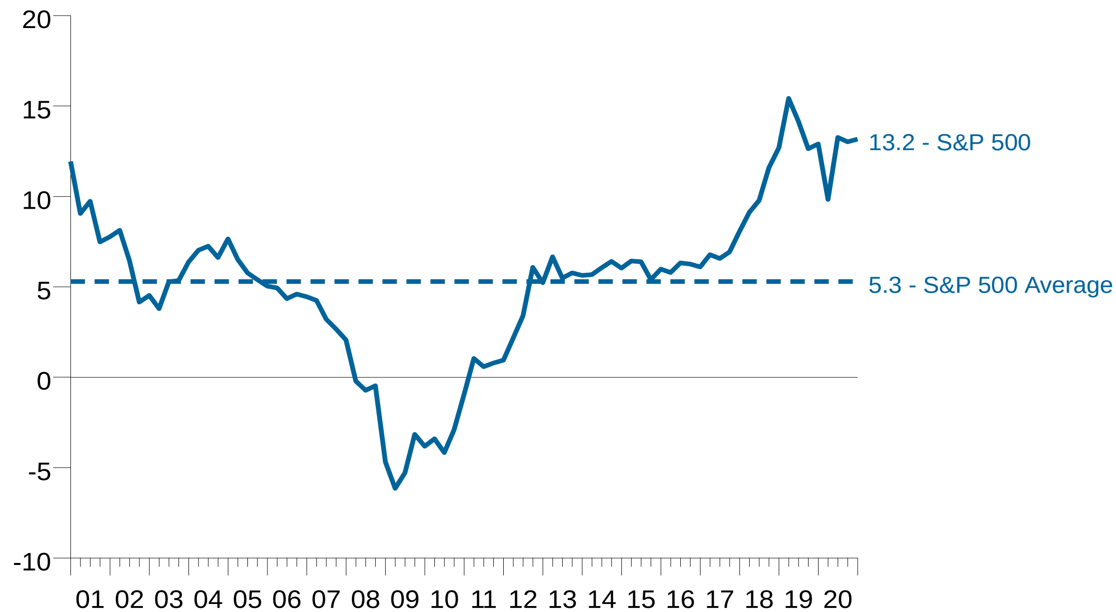
Index	S&P 500	Russell 2500
Dividend yield	2.00%	1.75%
Net buyback yield	0.50%	0.00%
Real earnings growth	2.25%	2.95%
Valuation adjustment	-0.25%	0.00%
Inflation	2.00%	2.00%
2021 compound return	6.50%	6.70%
2020 compound return	7.00%	7.25%
Change	-0.50%	-0.55%

U.S. Equity Projections

Equity risk premium: S&P 500 vs. T-bills

- Over the very long term, the equity risk premium (ERP) vs. cash is around 6%.
- Callan equity projection is at T-bills + 5.5%, a conservative estimate relative to long-term history.
- Over the past 20 years ERP vs. cash is lower at around 5%.
- Cash at 1.0%, ERP at 5.5% = Equity Return of 6.50%

Rolling 40-Quarter Relative Returns Relative to 90-day T-bill for 20 Years Ended 12/31/20



Source: Ibbotson

Global ex-U.S. Equity Projections

Developed and emerging markets

- Developed ex-U.S.
  - Arithmetic return = 8.25%
  - Compound return = 6.50%
  - Standard deviation = 19.90%
  - Compound return declines by 50 bps relative to 2020
  - Substantial decline in dividend yield partly offset by improved earnings growth
- Emerging Markets
  - Arithmetic return = 9.80%
  - Compound return = 6.90%
  - Standard deviation = 25.15%
  - 35 bps drop in compound return relative to 2020 projection
  - High earnings growth dented by significant share dilution
  - Relatively high expected inflation increases nominal return

Index	MSCI World ex USA	MSCI Emerging Markets
Dividend yield	3.00%	2.35%
Net buyback yield	0.00%	-2.35%
Real earnings growth	1.75%	4.50%
Valuation adjustment	0.00%	0.00%
Inflation	1.75%	2.40%
2021 compound return	6.50%	6.90%
2020 compound return	7.00%	7.25%
Change	-0.50%	-0.35%

Alternatives

Adam Lozinski, CFA

Private Equity

Background

The private equity market in aggregate is driven by many of the same economic factors as public equity markets.

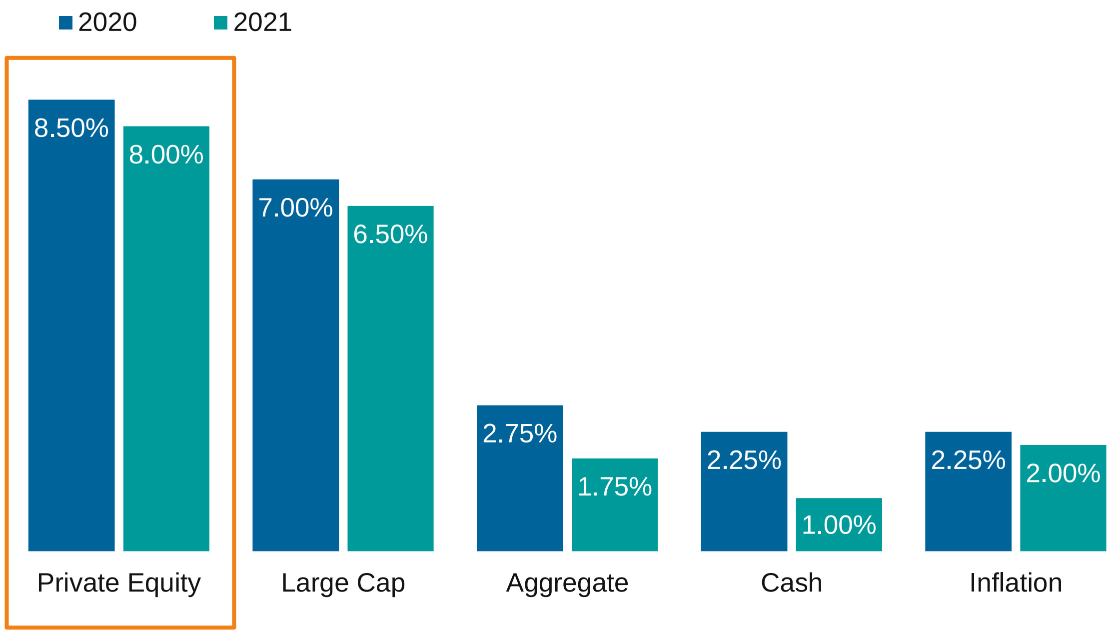
Consequently, the private equity performance expectations declined 50 basis points relative to where they were last year.

We see tremendous disparity between the best- and worst-performing private equity managers.

The ability to select skillful managers could result in realized returns significantly greater than projected here.

2021 private equity return projection: 8.00% (down 50 bps)

Return Projections



Real Estate

Background

Real estate returns held up surprisingly well in 2020.

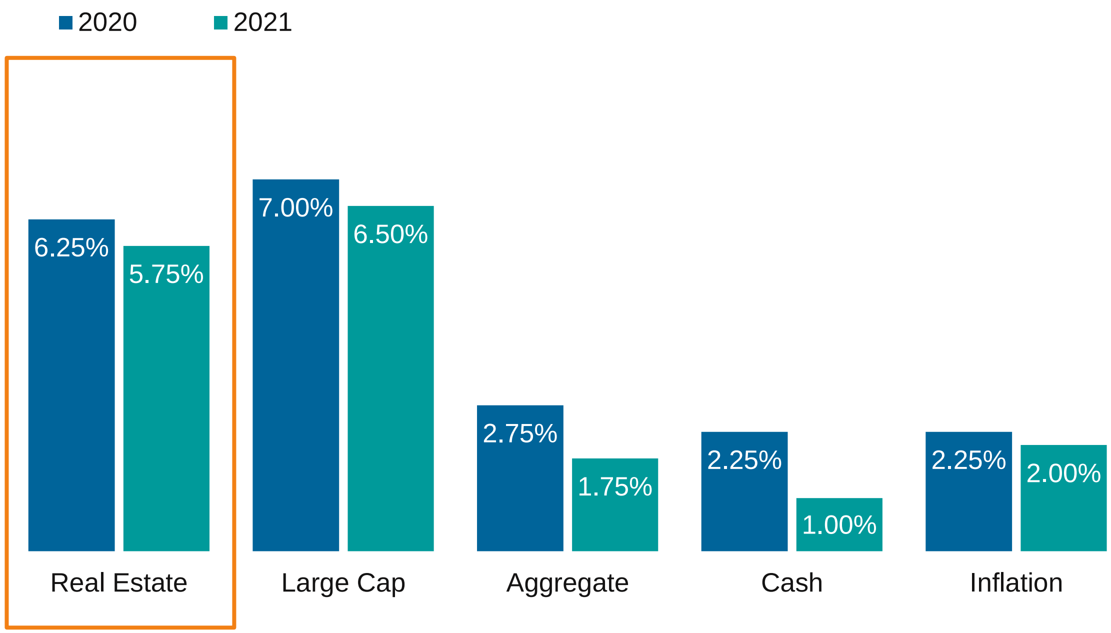
The foreseeable low interest rate environment should help to ensure that real estate continues to garner interest from investors seeking income, supporting returns.

However, the momentum in the industrial space is more than offset by the headwinds faced in the Retail and Office sectors, which should prove to be a drag on performance.

The combination results in a 50 basis point reduction in our outlook for real estate returns compared to last year.

2021 real estate return projection: 5.75% (down 50 bps)

Return Projections



Hedge Funds

Background

Hedge funds can be evaluated in a multi-factor context using the following relationship:

Expected Return = Cash + Equity Beta x (Equity-Cash) + Exotic Beta + Net Alpha

Callan's 10-year cash forecast is 1.00%, which is the starting point for our hedge fund returns.

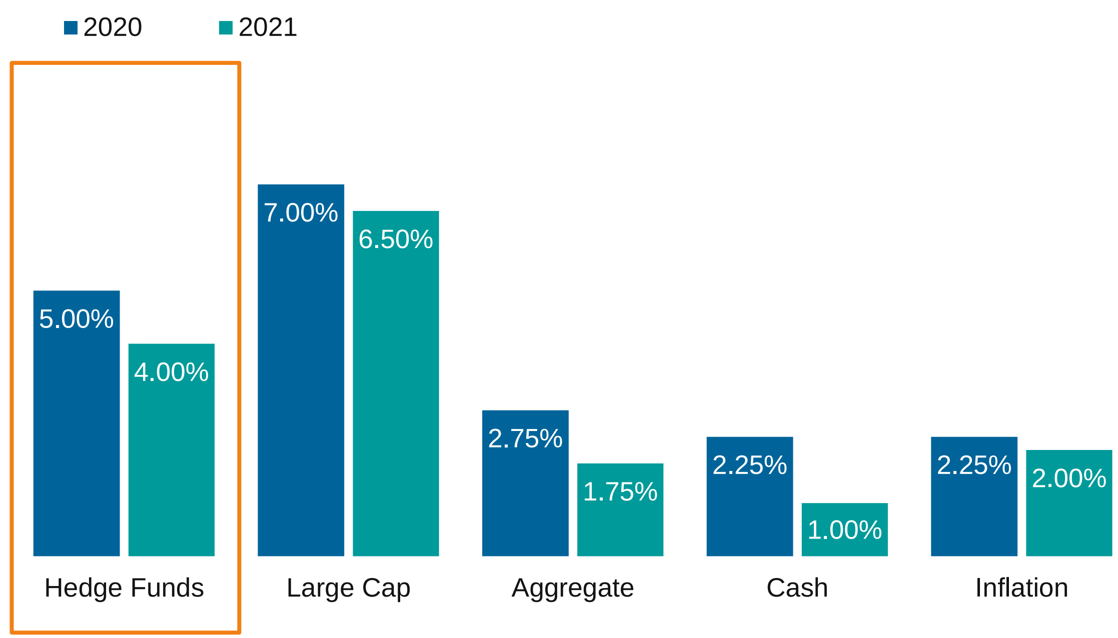
Diversified hedge fund portfolios have historically exhibited equity beta relative to the S&P 500 on the order of 0.4.

Combined with our equity risk premium forecast, this results in an excess return from equity beta of just over 2%.

Return from hedge fund exotic beta and illiquidity premia is forecast to be 0.5% to 1.0%, to arrive at an overall expected return of 4.0%.

2021 hedge fund return projection: 4.00% (down 100 bps)

Return Projections



Private Credit

Background

Return projection is for core, unlevered strategies (mainly direct lending) in an attractive environment for private credit returns and yields.

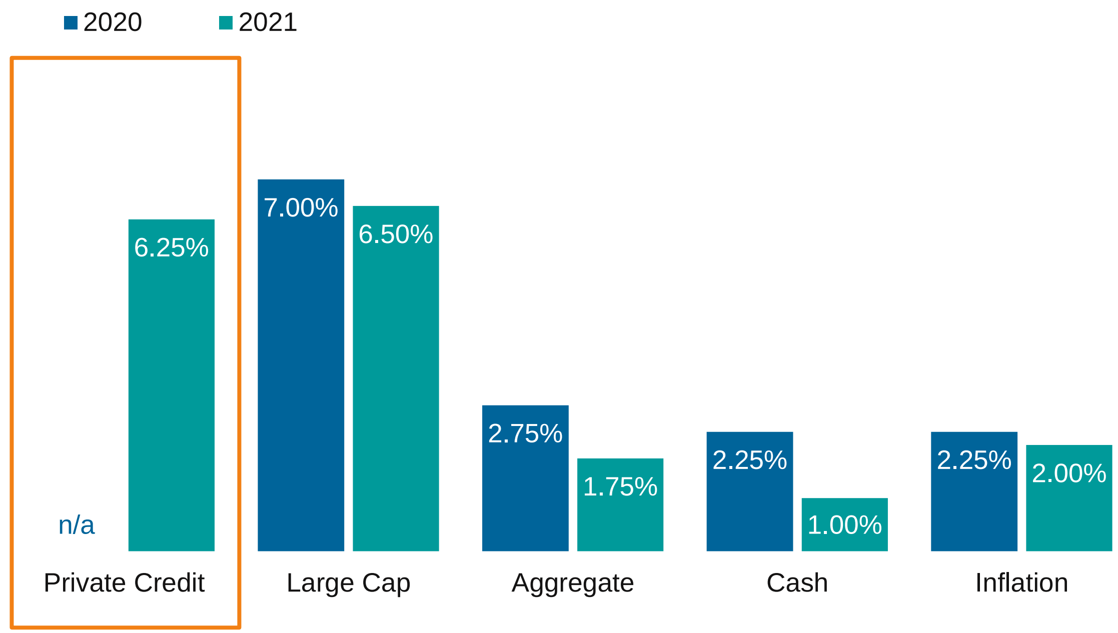
Private credit coupons haven't moved down as much as in the investment grade world since banks still have not re-entered the space.

~200 bps is a reasonable return premium relative to high yield (4.35%) and leveraged loans.

A portfolio with more distressed and specialty finance exposure would have a higher return though with a lower current yield and higher volatility and higher correlation to public and private equity.

2021 private credit return projection: 6.25% (no published projection in 2020)

Return Projections



Detailed 2021 Expectations and Resulting Portfolio Returns and Risks

Jay Kloepfer

2021 vs. 2020 Callan Capital Markets Assumptions

Asset Class	Index	Projected Return: 1-Year Arithmetic	Projected Return: 10-Year Geometric*	Projected Return: Real	Projected Risk: Standard Deviation	2020–2029: 1-Year Arithmetic	2020–2029: 10-Year Geometric*	2020–2029: Standard Deviation
Equities								
Broad U.S. Equity	Russell 3000	8.00%	6.60%	4.60%	17.95%	8.55%	7.15%	18.10%
Large Cap U.S. Equity	S&P 500	7.85%	6.50%	4.50%	17.70%	8.35%	7.00%	17.70%
Smid Cap U.S. Equity	Russell 2500	8.75%	6.70%	4.70%	21.30%	9.25%	7.25%	21.20%
Global ex-U.S. Equity	MSCI ACWI ex USA	8.70%	6.80%	4.80%	20.70%	9.10%	7.25%	20.50%
Developed ex-U.S. Equity	MSCI World ex USA	8.25%	6.50%	4.50%	19.90%	8.70%	7.00%	19.70%
Emerging Market Equity	MSCI Emerging Markets	9.80%	6.90%	4.90%	25.15%	10.25%	7.25%	25.70%
Fixed Income								
Short Duration Gov't/Credit	Bloomberg Barclays 1-3 Yr Gov / Credit	1.50%	1.50%	-0.50%	2.00%	2.70%	2.70%	2.10%
Core U.S. Fixed	Bloomberg Barclays Aggregate	1.80%	1.75%	-0.25%	3.75%	2.80%	2.75%	3.75%
Long Government	Bloomberg Barclays Long Government	1.35%	0.60%	-1.40%	12.50%	2.55%	1.80%	12.50%
Long Credit	Bloomberg Barclays Long Credit	2.95%	2.45%	0.45%	10.50%	3.75%	3.25%	10.50%
Long Government/Credit	Bloomberg Barclays Long Gov / Credit	2.30%	1.80%	-0.20%	10.35%	3.25%	2.75%	10.60%
TIPS	Bloomberg Barclays TIPS	1.80%	1.70%	-0.30%	5.05%	2.50%	2.40%	5.05%
High Yield	Bloomberg Barclays High Yield	4.85%	4.35%	2.35%	10.75%	5.10%	4.65%	10.25%
Global ex-U.S. Fixed	Bloomberg Barclays Global Agg xUSD	1.15%	0.75%	-1.25%	9.20%	1.30%	0.90%	9.20%
Emerging Market Sovereign Debt	EMBI Global Diversified	3.90%	3.50%	1.50%	9.50%	4.70%	4.35%	9.50%
Other								
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.75%	14.10%	7.05%	6.25%	14.00%
Private Infrastructure	MSCI Glb Infra / FTSE Dev Core 50/50	7.00%	6.00%	4.00%	15.45%	n/a	n/a	n/a
Private Equity	Cambridge Private Equity	11.50%	8.00%	6.00%	27.80%	12.00%	8.50%	27.80%
Private Credit	n/a	7.15%	6.25%	4.25%	14.60%	n/a	n/a	n/a
Hedge Funds	Callan Hedge FOF Database	4.25%	4.00%	2.00%	8.00%	5.25%	5.00%	8.70%
Commodities	Bloomberg Commodity	3.80%	2.25%	0.25%	18.00%	4.30%	2.75%	18.00%
Cash Equivalents	90-Day T-Bill	1.00%	1.00%	-1.00%	0.90%	2.25%	2.25%	0.90%
Inflation	CPI-U		2.00%		1.50%		2.25%	1.50%

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

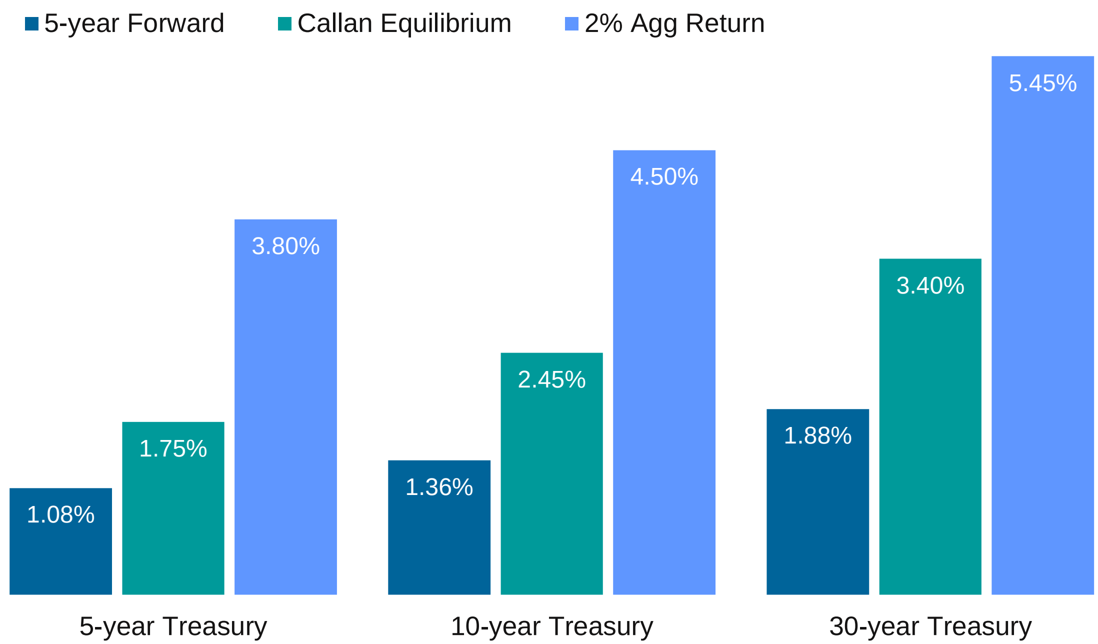
2021 Bond Assumptions vs. 2020

	Income Return	+	Capital Gain / Loss	+	Credit Default	+	Roll Return	=	2021 Expected Return	2020 Expected Return	Change
Cash	**1.00%**		**0.00%**		**0.00%**		**0.00%**		**1.00%**	**2.25%**	**-1.25%**
Short Duration 1-3 Year G/C	**1.55%**		**-0.30%**		**0.00%**		**0.25%**		**1.50%**	**2.70%**	**-1.20%**
1-3 Year Government	1.45%		-0.30%		0.00%		0.25%		1.40%		
1-3 Year Credit	2.10%		-0.30%		-0.20%		0.25%		1.85%		
Intermediate G/C	**1.85%**		**-0.50%**		**-0.10%**		**0.25%**		**1.50%**	**2.75%**	**-1.25%**
Intermediate Government	1.55%		-0.50%		0.00%		0.25%		1.30%		
Intermediate Credit	2.50%		-0.60%		-0.30%		0.25%		1.85%		
Aggregate	**2.50%**		**-0.90%**		**-0.10%**		**0.25%**		**1.75%**	**2.75%**	**-1.00%**
Government	2.15%		-1.20%		0.00%		0.25%		1.20%		
Securitized	2.05%		-0.30%		0.00%		0.25%		2.00%		
Credit	3.35%		-1.20%		-0.40%		0.25%		2.00%		
Long Duration G/C	**4.00%**		**-2.50%**		**-0.30%**		**0.60%**		**1.80%**	**2.75%**	**-0.95%**
Long Government	3.00%		-3.00%		0.00%		0.60%		0.60%		
Long Credit	4.65%		-2.30%		-0.50%		0.60%		2.45%		
TIPS	**2.35%**		**-0.90%**		**0.00%**		**0.25%**		**1.70%**	**2.40%**	**-0.70%**
Global ex-U.S. Fixed (unhedged)	**1.80%**		**-1.20%**		**-0.10%**		**0.25%**		**0.75%**	**0.90%**	**-0.15%**
High Yield	**6.70%**		**-0.40%**		**-2.20%**		**0.25%**		**4.35%**	**4.65%**	**-0.30%**
Emerging Market Debt	**5.95%**		**-1.30%**		**-1.40%**		**0.25%**		**3.50%**	**4.35%**	**-0.85%**
Bank Loans	**6.00%**		**-0.10%**		**-1.60%**		**0.00%**		**4.30%**	**4.30%**	**0.00%**

- Yields declined significantly in 2020
- Rising yields in Callan's baseline are especially supportive of shorter duration fixed income

Equilibrium Yields vs. Forward Curve and Yields Needed for 2% Agg Return

- Our base case equilibrium (reached in 5 years) is much higher than the Oct. 16, 2020, forward curve
- Aggregate return of 2.0% would require significantly higher rise in yields over the next 5 years



2021–2030 Capital Markets Assumption Correlations

	Broad U.S. Equity	Large Cap	Smid Cap	Gl ex-U.S. Equity	Dev ex-U.S. Equity	Em Market Equity	Short Dur	Core U.S. Fixed	Long Gov	Long Credit	Long Gov / Credit	TIPS	High Yield	Global ex-U.S. Fixed	Em Market Debt	Core Real Estate	Private Infra	Private Equity	Private Credit	Hedge Funds	Comm	Cash Equiv	Inflation
Broad U.S. Eq	1.00																						
Large Cap	1.00	1.00																					
Smid Cap	0.93	0.90	1.00																				
Gl ex-U.S. Equity	0.82	0.81	0.80	1.00																			
Dev. ex-U.S. Eq	0.78	0.77	0.77	0.98	1.00																		
Em Market Eq	0.80	0.79	0.76	0.93	0.84	1.00																	
Short Duration	-0.06	-0.06	-0.08	-0.08	-0.06	-0.10	1.00																
Core U.S. Fixed	-0.10	-0.10	-0.12	-0.12	-0.11	-0.14	0.81	1.00															
Long Gov	-0.15	-0.15	-0.16	-0.15	-0.13	-0.16	0.67	0.84	1.00														
Long Credit	0.27	0.28	0.25	0.26	0.26	0.24	0.64	0.80	0.69	1.00													
Long Gov / Cr	0.09	0.09	0.07	0.09	0.09	0.07	0.71	0.88	0.90	0.94	1.00												
TIPS	-0.08	-0.08	-0.08	-0.09	-0.09	-0.10	0.56	0.65	0.53	0.52	0.57	1.00											
High Yield	0.72	0.71	0.68	0.71	0.69	0.69	-0.01	0.00	-0.08	0.40	0.20	0.06	1.00										
Gl ex-U.S. Fixed	0.01	0.01	0.00	0.06	0.05	0.08	0.48	0.50	0.42	0.49	0.50	0.40	0.12	1.00									
Em Market Debt	0.53	0.53	0.51	0.56	0.52	0.58	0.08	0.12	0.05	0.35	0.24	0.18	0.60	0.15	1.00								
Core Real Estate	0.71	0.71	0.66	0.67	0.66	0.63	-0.01	-0.04	-0.09	0.24	0.10	-0.02	0.53	-0.02	0.36	1.00							
Private Infra	0.72	0.72	0.67	0.69	0.68	0.65	0.00	0.01	-0.03	0.27	0.15	-0.02	0.50	0.03	0.35	0.76	1.00						
Private Equity	0.80	0.80	0.76	0.78	0.76	0.74	-0.10	-0.19	-0.21	0.15	-0.01	-0.14	0.59	0.06	0.43	0.60	0.62	1.00					
Private Credit	0.74	0.73	0.70	0.72	0.70	0.69	0.00	-0.06	-0.10	0.28	0.12	-0.09	0.63	0.06	0.48	0.56	0.52	0.68	1.00				
Hedge Funds	0.78	0.78	0.73	0.76	0.74	0.73	0.10	0.14	0.07	0.39	0.27	0.09	0.64	0.05	0.55	0.52	0.47	0.60	0.61	1.00			
Commodities	0.26	0.26	0.25	0.25	0.25	0.25	-0.10	-0.10	-0.10	0.01	-0.04	0.10	0.15	0.15	0.19	0.21	0.18	0.23	0.17	0.23	1.00		
Cash Equiv	-0.06	-0.06	-0.08	-0.10	-0.10	-0.10	0.30	0.15	0.08	-0.05	0.01	0.12	-0.11	0.00	-0.07	0.00	-0.07	0.00	-0.06	-0.04	-0.02	1.00	
Inflation	-0.01	-0.02	0.02	0.01	0.00	0.03	-0.21	-0.25	-0.23	-0.25	-0.26	0.08	0.05	-0.10	0.00	0.10	0.06	0.06	0.06	0.15	0.29	0.05	1.00

- Relationships between asset classes are as important as standard deviation
- To determine portfolio mixes, Callan employs mean-variance optimization
- Return, standard deviation, and correlation determine the composition of efficient asset mixes

Source: Callan

2021 Callan Capital Markets Assumptions: Efficient Mixes

Subdued returns even for higher risk portfolios

- Portfolios range from 4.5% to 7.0% compound returns.
- A portfolio with approximately 36 % fixed income (Mix 3) is expected to earn 5.5% over the next 10 years.
- The fixed income allocation has to fall below 5% to earn more than 7%.
- Total alternatives allocations in excess of 15% are common for diversified asset mixes.
- Private equity is constrained to be no more than 25% of the total public equity exposure. The purpose of the constraint is to hold private equity to a relative share of total equity that is appropriate at each place along the efficient frontier. The assumed premium for private equity would cause an unconstrained optimization to allocate a disproportionate amount to private equity that would be neither prudent nor implementable.

	Optimal Mixes					
Asset Classes	Mix1	Mix 2	Mix 3	Mix 4	Mix 5	Mix 6
Broad U.S. Equity	17	21	25	29	34	39
Global ex-U.S. Equity	11	13	16	19	22	26
Core U.S. Fixed	54	45	36	26	15	3
Core Real Estate	6	7	8	10	11	13
Hedge Funds	5	5	5	4	4	3
Private Equity	7	9	10	12	14	16
Totals	100	100	100	100	100	100
Projected Arithmetic Return	4.72	5.33	5.98	6.67	7.42	8.25
Projected Standard Deviation	7.81	9.36	11.07	12.92	14.96	17.21
10-Yr. Geometric Mean Return	4.50	5.00	5.50	6.00	6.50	7.00
Public Equity	28	34	41	48	56	65
Public Fixed Income	54	45	36	26	15	3
Alternatives	18	21	23	26	29	32

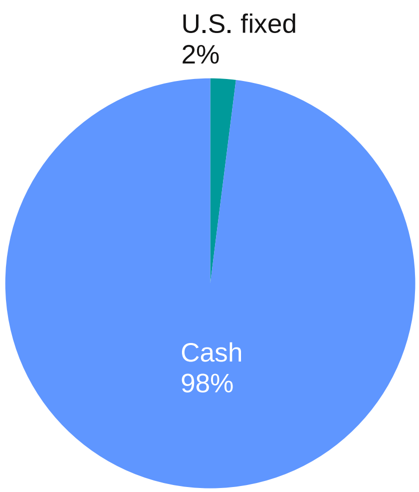
Source: Callan

Summary of Important Changes for 2021 Capital Markets Assumptions

- Cash return lowered to 1.0%
- Core fixed income return down 1.0%, to 1.75%
- Public equity returns down 45-55 bps; equity risk premium over both cash and fixed income widened
- Inflation lowered 25 bps to 2.0%
- Efficient smid cap weight set to 15% of broad U.S. equity
- Efficient emerging market equity weight set to 30% of global ex-U.S. equity
- Efficient U.S. / global ex-U.S. equity split to 60/40 neutral weight (not a change, but the market has now caught up to us!)
- Private markets returns lowered commensurate with public equity; hedge funds reflect starting cash return
- Ever-broadening set of diversifying asset classes to consider
  - Private credit
  - Private infrastructure
  - Inflation sensitive equity – REITs, natural resources, global listed infrastructure

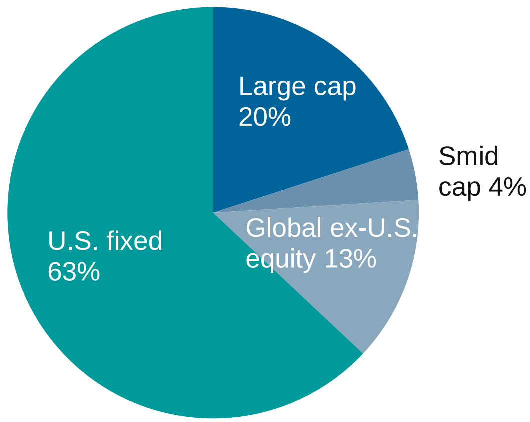
7% Expected Returns Over Past 30+ Years

Increasing Complexity



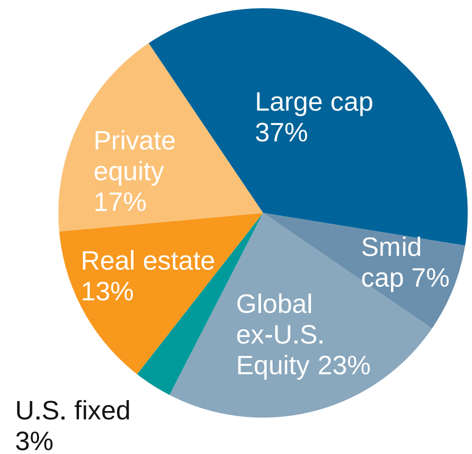
1991

Return:	**7.0%**
Risk:	**1.1%**



2006

Return:	**7.0%**
Risk:	**6.7%**



2021

Return:	**7.0%**
Risk:	**17.3%**

Increasing Risk

In 1991, our expectations for cash and broad U.S. fixed income were 6.95% and 8.95%, respectively

Return-seeking assets were not required to earn a 7% projected return

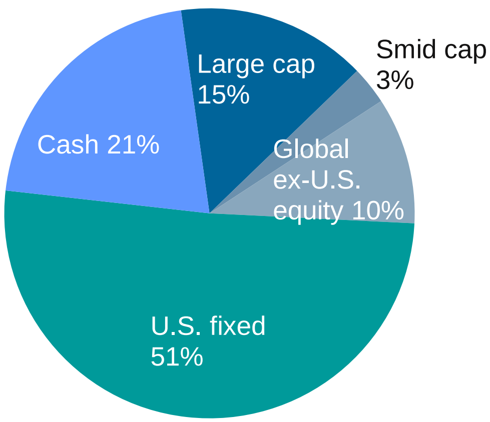
15 years later, an investor would have needed over a third of the portfolio in public equities to achieve a 7% projected return, with 6x the portfolio volatility of 1991

Today an investor is required to include 97% in return-seeking assets to earn a 7% projected return at almost 16x the volatility compared to 1991

Source: Callan

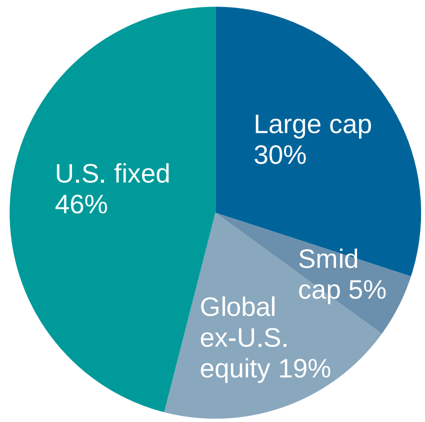
5% Expected Real Returns Over Past 30+ Years

Increasing Complexity



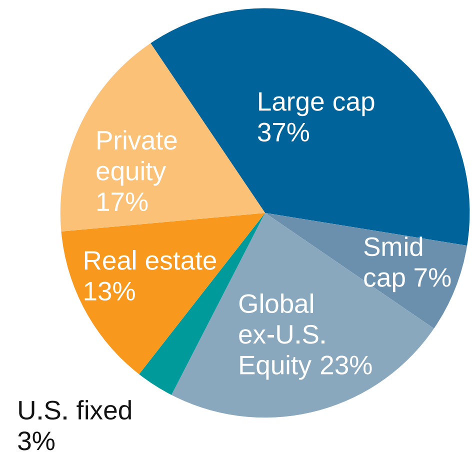
1991

Inflation:	**5.00%**
Real Return:	**5.0%**
Risk:	**6.6%**



2006

Inflation:	**2.75%**
Real Return:	**5.0%**
Risk:	**9.3%**



2021

Inflation:	**2.00%**
Real Return:	**5.0%**
Risk:	**17.3%**

Increasing Risk

Despite a 5% inflation projection, an investor could have almost three-quarters of the portfolio in low-risk assets (cash and fixed income) and still earn a 5% projected real return in 1991

15 years later, an investor would have needed over half of the portfolio in public equities to achieve a 5% projected real return

Today an investor must have 97% in return-seeking assets to earn a 5% projected real return at over 2.5x the volatility compared to 1991

Source: Callan

Callan Institute

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